

ABSTRACT

A method for forming an adaptive phased array transmission beam pattern at a base station without any knowledge of array geometry or mobile feedback is described. The approach is immune to the problems which plague methods which attempt to identify received angles of arrival from the mobile and map this information to an optimum transmit beam pattern. In addition, this approach does not suffer the capacity penalty and mobile handset complexity increase associated with mobile feedback. Estimates of the receive vector propagation channels are used to estimate transmit vector channel covariance matrices which form objectives and constraints in quadratic optimization problems leading to optimum beam former solutions for the single user case, and multiple user case. The new invention is capable of substantial frequency re-use capacity improvement in a multiple user cellular network.